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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/750,125	12/29/2000	Mitsuhiro Kanada	Q62454	6746

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EXAMINER

CHANG, VICTOR S

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

LD

Supplemental
Office Action Summary

Application No.

09/750,125

Applicant(s)

KANADA ET AL.

Examiner

Victor S Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2004 and 13 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 16 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u>2/15/2005</u> . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Introduction

1. The Examiner has carefully considered Applicants' amendments and remarks filed on 12/13/2004 and 10/13/2004.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Rejections not maintained are withdrawn. In particular, as summarized in attached interview summary, in response to Applicants' inquiry of the status of claims 16 and 17, over a telephone interview on 2/15/2005 with Applicants' Attorney John Shin, the Examiner apologizes for inadvertently not including claims 16 and 17 in the headings of section 4 of Office action dated 1/21/2005. The Examiner has agreed to issue a supplemental Office action to correct the error, with a restart of response period. Nevertheless, it should also be noted that the Office Action Summary (PTO-326) mailed 1/21/2005 did correctly identify the status of the claims 16 and 17 as rejected, and section 4 also correctly addressed the subject matter of claim 17.

Rejections Based on Prior Art

4. Claims 1, 3-10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/47573 in view of Nakae et al. (US 4353817), generally as set forth in section 4 of Office action dated 4/13/2004, together with the following additional reasoning.

First, the Examiner repeats (see Office action dated 6/21/2002) the relied upon prior art references as follows: WO '573 is directed at a low-density microcellular thermoplastic elastomeric foams with closed cells. The foam is made using supercritical fluid CO₂ as the blowing agent (Abstract). The polymer and the blowing agent are mixed in the melt stage in a tandem extruder under high temperature and pressure, subsequently the temperature and pressure are reduced to initiate foaming (page 3, lines 9-17). Depends on pressure drop rates between 0.1 to 15 GPa, thermoplastic foams having various densities between 6 to 14 pcf, and uniform cell sizes of about 100 to 150 microns are obtained (page 4, lines 8-30). Various foam properties such as the density, cell structure and size, compression set, etc. may be adjusted by varying the foaming conditions (page 5, lines 23-26). The optimal compression set is less than about 30% (page 5, line 30). Table 1 shows suitable foam materials include SANTOPRENE[®], SEBS resin, polyethylene, etc. Further, WO '573 expressly teaches that SANTOPRENE[®] is a blend of polypropylene and ethylene propylene (EPDM) copolymer (page 3, lines 2-5).

For claims 1, 5, 6, 8-10 and 17, WO '573 lacks express teachings of the pressure range of the mixture before decompressing, the compressive load of the expanded material, the soundproofing properties, and the metal hydroxide flame retardant. However, it is noted that WO '573 does teach the pressure drop rates between 0.1 to 15 GPa, as set forth above, which clearly reads instantly claimed high pressure of 6 to 100 MPa. As to the compressive load of the expanded load, it is also noted that WO '573 does expressly teach that optimal compression set is less than about 30%. As such, it

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is the Examiner's position that, in the absence of unexpected results, a suitable compressive load is an obvious optimization to one of ordinary skill in the art of foam materials, motivated by the desire to obtain required cushioning properties. Regarding the soundproofing properties of the expanded material, although WO '573 is silent about the specific use of the foam as soundproofing material, since WO '573 does teach the microcellular thermoplastic foams as claimed, as set forth above, it is the Examiner's position that its soundproofing properties is inherent, and the selection of suitable foams taught by WO '573 with suitable soundproofing properties is an obvious optimization to one of ordinary skill in the art of soundproofing foams, motivated by the desire to meet required acoustic requirements. It should be noted that mere recognition of latent properties in the prior art does not render nonobvious an otherwise known invention.

MPEP § 2145.II. Finally, while WO '573 lacks a teaching of using hydrated metal compounds as flame retardants. However, it is noted that Nakae's invention is related to polymer foams with high flame retardancy (Abstract), and Nakae expressly teaches that by adding hydrated metal compounds render the polymer foams highly flame retardant (column 2, lines 52 to column 3, line 11). Further, Nakae discloses that the hydrated metal oxide has a general structural formula $M_mO_n \cdot xH_2O$, for example, aluminum hydroxide ($Al_2O_3 \cdot 3H_2O$ or $Al(OH)_3$), magnesium hydroxide ($MgO \cdot H_2O$ or $Mg(OH)_2$), etc. (column 7, lines 21-37). As such, it would have been obvious to one of ordinary skill in the art to incorporate hydrated metal compound in the thermoplastic foams, as taught by Nakae, motivated by the desire to improve the flame retardancy of the foams made by the methods taught by WO '573. Additionally, in the absence of

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unexpected results, it is the Examiner's position that composite (mixture) metal hydrides, such as $\text{MgO} \cdot \text{ZnO} \cdot \text{H}_2\text{O}$ as recited in claim 17, are also obvious selection of flame retardant, because it is *prima facie* to combine two compositions each of which is taught by prior art Nakae to be useful for the same purpose, so as to form a third composition to be used for the very same purpose, motivated by the desire to improve the flame retardancy of the foams of WO '573. See MPEP § 2144.06.

For claims 3 and 4, WO '573 teaches that the polymers and any optional fillers are first melt compounded in a Brabender or twin-screw extruder, then mixed with the blowing agent for foaming (page 3, lines 18-25).

For claim 7, the Examiner repeats (see Office action dated 6/21/2002, page 3) that it is noted that it is well known that CO_2 typically reaches supercritical fluid state under high pressure over 10 MPa. Further, since Applicant fails to specifically point out any supposed error in Examiner's position in the response, the aforementioned statement is taken to be admitted prior art.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/47573 in view of Nakae et al. (US 4353817), and further in view of Applicants' admitted prior art JP-A-322168, generally as set forth in section 4 of Office action dated 4/13/2004, together with the following additional reasoning.

The teachings of WO '573 and Nakae are again relied upon as set forth above.

The Examiner repeats (see Office action dated 6/21/2002, page 3) that Applicants seems to admit that it is known art to impregnate a pre-formed unexpanded thermoplastic molding, as taught by the prior art JP-A-322168 (Specification, page 4,

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paragraph 2). Further, since Applicant fails to specifically point out any supposed error in Examiner's position in the response, the aforementioned statement is taken to be admitted prior art.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/47573 either individually, or in view of admitted prior art, and further in view of Nakae et al. (US 4353817), generally for the reasons set forth in Section 6 of Office action dated 10/17/2002, together with the additional reasoning as set forth above.

Response to argument

7. With respect to Applicants' argument "even if skilled artisan were to combine Nakae and WO '573, the combination would not result in the claimed invention" (Remarks 12/13/2004, pages 3-4, bridging paragraph), the Examiner notes that Applicants fail to provide a clear reasoning why the combination would not result in the claimed invention. The Examiner reasserts that, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to modify the thermoplastic foams of WO '573 with the hydrated metal compounds taught by Nakae, including composite (mixture) metal hydrides, such as $\text{MgO} \cdot \text{ZnO} \cdot \text{H}_2\text{O}$, because it is *prima facie* to combine two compositions each of which is taught by prior art to be useful for the same purpose, as set forth above.

Regarding Mr. Yamamoto's Declaration, filed 10/13/2004, Applicants' argument "the Declaration ... sets out clear evidence of unexpectedly superior results ... the use of $\text{Al}_2\text{O}_3 \cdot n\text{H}_2\text{O}$ in Comparison Examples 1-3 resulted in low degrees of expansion and

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unacceptable flame retardancy ... the unique effect (unexpectedly high degree of expansion) of the presently claimed invention ... would not be obvious to one skilled in the art ..." (Remarks 12/13/2004, page 4) has been carefully considered, but is not persuasive. First, the Examiner notes that the Declaration appears to contain an error in identifying the metal hydride used in Experiment 4 as $\text{MgO} \cdot \text{ZiO} \cdot \text{H}_2\text{O}$ (page 3), whereas as the table in page 4 correctly identifies the instantly claimed $\text{MgO} \cdot \text{ZnO} \cdot \text{H}_2\text{O}$, as recited in claim 1. Second, the Examiner notes that Applicants' comparison of the degrees of expansion of thermoplastic foams containing $\text{Al}_2\text{O}_3 \cdot n\text{H}_2\text{O}$ vs. $\text{MgO} \cdot \text{ZnO} \cdot \text{H}_2\text{O}$ fail to recognize that it would have been obvious to one of ordinary skill in the art to use composite (mixture) metal hydrides, such as $\text{MgO} \cdot \text{ZnO} \cdot \text{H}_2\text{O}$, as set forth above. In particular, there is no data showing the degree of expansion of a relevant component metal hydride, such as $\text{MgO} \cdot \text{H}_2\text{O}$, as taught by Nakae. Further, it is noted that Applicants' declaration states that the results⁶ are attributed to the affinity between a resin and a flame retardant (Declaration, page 5, first paragraph), the Examiner notes that such a statement also appears to indicate that the expansion results are expected¹ whenever a $\text{MgO} \cdot \text{H}_2\text{O}$ (taught by Nakae) flame retardant is selected.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor S Chang whose telephone number is 571-272-1474. The examiner can normally be reached on 8:30 - 5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel H Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Victor S Chang
Examiner
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2/15/2005